

Claim Amendments

1. (original) An apparatus, comprising:

one or more heating elements; and

one or more elongated beams;

wherein the one or more heating elements comprise a heating element, wherein the one or more elongated beams comprise an elongated beam, wherein the heating element is coupled with the elongated beam;

wherein the heating element induces a time-varying thermal gradient in the elongated beam to cause one or more oscillations of one or more of the one or more elongated beams.

2. (original) The apparatus of claim 1, wherein the heating element employs the time-varying thermal gradient in the elongated beam to cause one or more thermoelastic reactions in the elongated beam that effect one or more of the one or more oscillations.

3. (original) The apparatus of claim 1, wherein the heating element comprises a resistor;

wherein the resistor conducts a time-varying electrical signal, wherein the time-varying electrical signal induces a Joule heating of the resistor that causes the time-varying thermal gradient in the elongated beam.

4. (original) The apparatus of claim 1, wherein the heating element induces the time-varying thermal gradient in the elongated beam to cause the one or more oscillations to occur approximately at a natural frequency of the elongated beam.

5. (original) The apparatus of claim 4, wherein the elongated beam comprises a first elongated beam, wherein the one or more elongated beams comprise a second elongated beam, wherein the natural frequency of the first elongated beam is substantially the same as a natural frequency of the second elongated beam;

wherein a nodal point of the first elongated beam abuts a first face of a transverse beam;

wherein a nodal point of the second elongated beam abuts a second face of the transverse beam;

wherein the heating element cooperates with the first elongated beam to cause one or more oscillations of the second elongated beam approximately at the substantially same natural frequency of the first elongated beam and the second elongated beam.

6. (original) The apparatus of claim 5, wherein the heating element oscillates the first elongated beam to stress the transverse beam to cause the one or more oscillations of the second elongated beam.

7. (original) The apparatus of claim 1, wherein the heating element induces the time-varying thermal gradient in the elongated beam to cause the one or more oscillations to occur approximately at a natural frequency of the one or more of the one or more elongated beams.

8. (original) The apparatus of claim 1, further comprising:

a feedback component coupled with the elongated beam;

wherein the feedback component provides feedback to a regulator component that serves to regulate one or more of the one or more oscillations of the one or more of the one or more elongated beams.

9. (original) The apparatus of claim 8, wherein the feedback component comprises a piezoresistor;

wherein the piezoresistor comprises a variable resistance that changes based on a magnitude of the one or more of the one or more oscillations of the one or more of the one or more elongated beams;

wherein the piezoresistor provides feedback based on the variable resistance of the piezoresistor to the regulator component that serves to regulate the time-varying thermal gradient in the elongated beam to cause the one or more oscillations of the one or more of the one or more elongated beams.

10. (original) The apparatus of claim 8, wherein the feedback component comprises a capacitive sensor;

wherein the capacitive sensor comprises a variable capacitance that changes based on a magnitude of the one or more of the one or more oscillations of the one or more of the one or more elongated beams;

wherein the capacitive sensor provides feedback based on the variable capacitance of the capacitive sensor to the regulator component that serves to regulate the time-varying thermal gradient in the elongated beam to cause the one or more oscillations of the one or more of the one or more elongated beams.

11. (new) The apparatus of claim 3, wherein the resistor conducts a time-varying electrical current to induce the Joule heating of the resistor.

12. (new) The apparatus of claim 5, wherein the one or more oscillations of the one or more of the one or more elongated beams comprise a harmonic oscillation of the one or more of the one or more elongated beams.

13. (new) The apparatus of claim 8, further comprising:
a plurality of feedback components that are coupled with one or more of the one or more elongated beams, wherein the plurality of feedback components comprise the feedback component.

14. (new) The apparatus of claim 13, wherein the plurality of feedback components are arranged in a Wheatstone bridge;
wherein the regulator component and the Wheatstone bridge cooperate to regulate the time-varying thermal gradient through the resistor.

15. (new) The apparatus of claim 14 in combination with the regulator component, wherein the regulator component comprises a difference amplifier.

16. (new) The apparatus of claim 15, wherein the difference amplifier serves to amplify a current flow across a plurality of output terminals of the Wheatstone bridge;
wherein the regulator component employs the current flow across the output terminals of the Wheatstone bridge to regulate the time-varying thermal gradient through the resistor.

17. (new) The apparatus of claim 16, wherein the heating element comprises a resistor that conducts a time-varying electrical current, wherein the time-varying electrical current induces a Joule heating of the resistor that causes the time-varying thermal gradient in the elongated beam.

18. (new) The apparatus of claim 17, wherein the regulator component regulates the time-varying electrical current through the resistor to keep a frequency and/or an amplitude of the one or more oscillations of the elongated beam remain within a desired range.